Regulatory Finance Concepts Educational Seminar

Session 4: The Cost of Equity

Presented to the
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The Cost of Debt v. Equity

- The cost of debt is a contractual cost, but the cost of equity an *expectational* cost
  - The return willing investors must expect or anticipate receiving to induce them to provide equity funds
- The cost of equity must be estimated
  - Often the subject of considerable debate
  - Generally more difficult to determine than the cost of debt

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Cost of Equity Issues

- A reasonable return on invested capital is part of the revenue requirement
- Often one of the most contentious issues in a rate case involves determining a reasonable rate of return on rate base
- There are many assumptions and judgement used to calculate the cost of equity

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Fundamental Difference in Estimating Cost of Debt and Equity

- Both Debt and Equity have income streams that establish their value
  - Income stream of debt: fixed when the bond is issued
  - Income stream for equity: varies over time depending on a variety of circumstances
- The cost of debt is a function of the utility's credit rating
- The cost of equity is dependent upon investor expectations of its performance
- Estimating the cost of equity requires forecasting future performance

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Estimating the Cost of Equity

- Numerous methods have been suggested and used:
  - Comparable earnings analysis
  - Risk-premium analysis
  - Discounted cash flow (DCF)
  - Capital asset pricing model analysis (CAPM)

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Models of the Cost of Equity have Different Perspectives

- **Discounted cash flow (DCF)**: based on the time value of money
- **Capital Asset Pricing Model**: based on the notion that a securities return is equal to the risk-free rate of return plus a risk-adjusted risk premium
- **Risk Premium Method**: recognizes that common equity is riskier than debt and therefore must earn a premium over debt
- **Comparable earnings method**: based upon accounting concepts of earnings per share and the book value of common equity per share
- **Expected earnings**: forward-looking version of comparable earnings

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Using multiple methods and estimates

- Each method provides a different model of the future
- Within each method, there may be multiple alternatives as to how to frame the future
- Using alternative models brings different perspectives
- Various inputs have different impacts on models
- It is the role of the Commission to weigh the evidence presented and determine the relative weight to give different models and assumptions

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Comparable Earnings Analysis

- Based on *Bluefield*
- Attempts to determine what rates of return on equity are being earned by other firms
  - May use the Fortune 500 or the S&P 400 or 500 as a basis
  - Estimates the cost of equity (K_E) based on average reported returns of other firms
- May not account for risk differentials and there is no guarantee that reported equity returns reflect the cost of equity
- Need to establish a peer group

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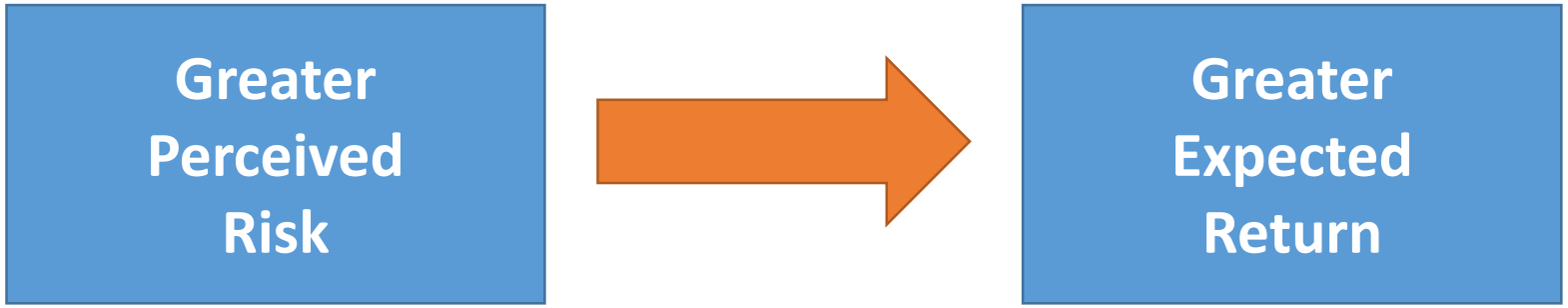
Risk-Premium Analysis

- Based on one of the fundamental ideas of finance:



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Risk-Premium Analysis (cont'd)

- Estimates the cost of equity (K_E) as the current bond yield plus an equity risk premium
  - Premium might be based on the historical average spread between stock and bond returns
  - Could use either government or corporate bond yield as basis

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Risk-Premium Analysis (cont'd)

- Cost of equity rises and falls with bond yields
- Assumes that relative risk premia will be stable
- May have to be adjusted if company is more or less risky than average
- Need to determine an appropriate historical time frame for analysis

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Risk-Premium Analysis (cont'd)

- Example:
  - Avg. annual return on large company stocks (1925-2015) = **11%**
  - Avg. annual return on long-term treasury bonds (1925-2015) = **5.3%**
  - This yields an average annual equity risk premium of **5.7%**
  - Therefore, given a current long-term treasury yield of **5.5%,** the implied expected return on large company stocks would be **11.2%**

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Use of Proxy Groups a Shared Analytical feature of DCF and CAPM

- Both the DCF and CAPM require using proxy groups
- Proxy groups are companies “like” for whom the cost of capital is being forecast
- DCF uses proxy companies to estimate expectations of future growth
- CAPM uses proxy companies to estimate ß
- The choice of the Proxy group frames the analysis and will can have an important impact on results

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Discounted Cash Flow (DCF) Analysis

- Based on notion that equity investors have two sources of retur
  - Dividend yield
  - Growth in value
- The cost of equity, K_E , is estimated by

$$K_E = \frac{D}{P} + g$$

  - **"D/P"** is an estimate of the yield over the next year
  - **"g"** is an estimate of long-term growth in dividends
- The cost of common equity is equal to the dividend yield plus dividend growth

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Critical assumptions in DCF

- Constant average growth rate for dividends and earnings
- Stable ratio of dividend payout
- A constant P/E (Price to Earnings ration)
- The discount rate must be greater than the expected growth rate

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DCF Analysis – Example

- Suppose **D** = $1.20, **P** = $30.00, and your estimate of **g** = 7%

The DCF estimate of K_E would be

$$\mathbf{K_E} = (1.20/30) + .07$$
$$= .04 + .07 = .11$$
$$\text{or } 11\%$$

Note: This might be adjusted upwards a bit to allow for flotation costs – the cost of issuing new stock.

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DCF Analysis (Cont'd)

- Calculating the dividend yield is fairly straightforward
  - It's the estimated yield over the next year given current stock price; that is, the current dividend adjusted for growth divided by the current price
- Estimating growth is more difficult and uncertain – best practices for establishing the growth rate
  - Simple DCF models assume stable growth rates
- Small changes in the growth estimate make for large changes in K_E and in $ of revenue requirement

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Capital Asset Pricing Model (CAPM)

- The simplifying assumption underlying CAPM is that rational investors hold a highly diversified portfolio (*i.e.*, market portfolio)
- CAPM focuses on security's risk relative to the market portfolio and ignores firm specific risk
- According to CAPM required rate of return is equal to the risk-free rate of return plus a risk premium that reflects the riskiness of the stock after diversification. Firm-specific risk does not enter into the calculation of the required return in CAPM.

$$ks = kRF + (kM - kRF)\ ß$$

  - where:

    ks= return on firm's equity

    kRF= risk free rate

    kM= return on overall market portfolio

    (kM - kRF) = market risk premium

    ß = firm's market risk

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Requirements for Calculating CAPM

- Risk Free Rate – typically Treasury bonds
- Market Risk Premium – return on the broad stock market minus the risk-free interest rate
- ß, firm's market risk is measured by the covariance between the risk free rate and return on the market as a whole, where covariance is a measure of joint variability of two variables.
- Each of these variables are forward looking and a source of judgment is how to modify assumptions of the future based on existing relationships

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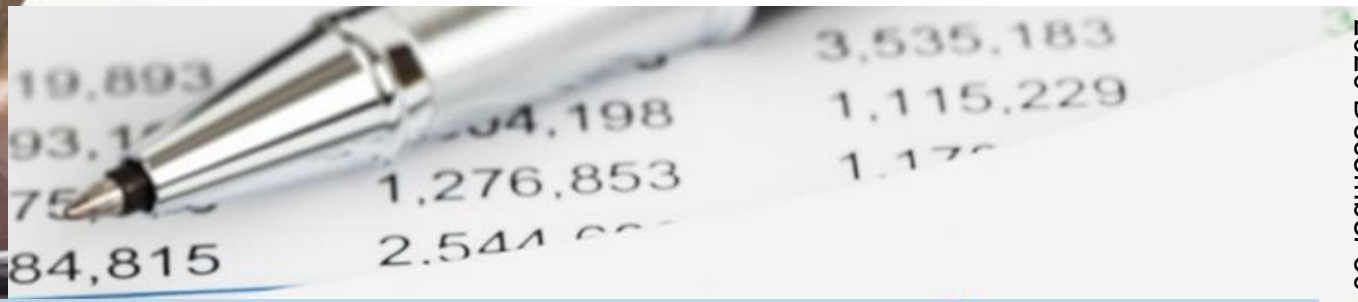
Upcoming Courses



Introduction to Utility Accounting, with Bill Steele

Jan 26-28, 2021

Introduction to Utility Finance, with Mark Cicchetti (Florida PSC)

Feb 16-18, 2021

Registration opens January 6th

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